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AIRCRAFT RADIO COMMUNICATIONS IN THE USSR

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This article is a historical review of Russian and Soviet developments in the field of aircraft radio communications. The author attempts to build a strong case for Russian and Soviet priority in this field, as indicated in the brief outline presented below. He reaches the following conclusions regarding quality of Soviet equipment during World War II:

"The radio equipment of our aircraft during the course of the whole war was superior in quality to that of the enemy. After the defeat of Germany, captured technical documents revealed that German radio specialists considered the equipment in Soviet fighter aircraft to be remarkable in regard to compactness and light weight. Thus, for example, German fighter radios weighed three times as much as Soviet sets, yet had about half of their effective range. RAF aircraft radios also had about half the range of Soviet fighters although they were more than 1½ times as heavy. Even the US Air Corps planes used radio equipment which was somewhat heavier though inferior in quality. The postwar period has been characterized by further successful development of Soviet aeronautical science, including a parallel development of Soviet radio engineering."

Remainder of article dwells on details of historical developments, outlined below.

The idea of radio communication with aircraft was first conceived by a Russian army officer, Lieutenant Sokol'tsev, who carried out a series of experiments with a modified army field transmitter. On 11 November 1911, he succeeded in establishing one-way, air-to-ground radio contact over a distance of 20 km. Soon thereafter, Russian aircraft were equipped with radio sets for directing artillery fire. Similar installations were not carried out in foreign aircraft until some years later.

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Prior to these experiments, A. S. Popov, the inventor of radio, took an active interest in military applications of wireless telegraphy, which culminated in 1899 in successful radio contact between two ships at a distance of 16 miles. The portable sets built by Popov in 1900 were the first light-weight sets ever designed for use under battle conditions. Popov was the first to observe the reflection of electromagnetic waves from ships (1897), which led to the development of radar techniques some 40 years later. He also carried out joint experiments in 1899 with his close collaborators, P. N. Rybkin and D. S. Troitskiy, on the transmission of radiotelegraph signals from a balloon to ground.

At the beginning of World War I, T. S. Bersenev, under the guidance of N. D. Papaleksi (later an active member of the Academy of Sciences USSR), constructed an airborne transceiver weighing 28 kg and using a trailing antenna. In 1916, a more compact and lighter airborne spark transmitter with an ac generator power supply was designed and manufactured.

After the October Revolution, the Nizhegorod Radio Laboratory laid the groundwork for the development of high-quality military communications equipment. The first vacuum tube sets made an appearance soon after. A. I. Kovalenkov developed the AK radiotelephone transmitter in 1921 and the AK-23 in 1923. The latter was replaced in 1925 with the 13-S model, which had a voice range of 200 km (three to four times greater on code), and operated on 500-1,000 kc.

Soviet designers were the first to develop an electric intercommunication system for aircraft, designated MR for "Mestnoye (local) Radio."

During the first Five-Year Plan, a first-class aviation industry was established, which included a parallel development of aircraft radio production. Short waves came into use in the Soviet Air Force with the introduction of the 14-SK model, and later, the 13-SK and 11-SK models.

In 1936, special radio equipment was designed for the ANT-25 airplane used in the polar flights of that period. This set gave exceptional performance, 6,000-km range on 10-w power, and served as the basis for further development of radio equipment for military aviation. Among sets developed during this period were the RSR (reconnaissance planes), RSB (bombers), and RSI (fighters). These sets were considered to be superior to foreign makes in most respects.

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